IN THE SPECIFICATION

Page 3, lines 13-15 have been amended as follows:

The present invention provides a pressure tank installed within the well casing of a well. The pressure tank **has** ~~having~~ an outside diameter to fit inside a well casing having an inner diameter greater than the outside diameter of the pressure tank.

Page 7, lines 17 and 18 have been amended as follows:

FIG. 6 is an enlarged exploded view of the components of the inlet end cap ~~of the~~ of the inlet end of FIG. 5;

Page 17, lines 1-4 have been amended as follows:

Referring now to FIG. 4, a first embodiment of a pressure tank according to the present invention is shown. This embodiment is equivalent to the pressure tank shown in FIGS. 1A, 1B, 2A, 2B, 3A and 3B. FIGS. 4-8 **illustrate** ~~illustrates~~ the details of pressure tank 12 and of attaching and sealing the flexible diaphragm bladder 58 to the inlet 40 and outlet 42 ends of the tank 12.

Page 17, line 5 through page 24, line 15 have been amended as follows:

The bladder 58 preferably includes an inlet opening 88 at an inlet end 92 and an outlet opening 90 at an outlet end 94. The inlet opening 88 of the flexible diaphragm bladder 58 is sealed to the inlet end 40 of the tank 12 with the at least one bottom clamp 68, and the outlet opening 90 of the flexible diaphragm bladder 58 is sealed to the outlet end 42 of the tank 12 with the at least one top clamp 70.

FIGS. 5 and 6 illustrate the inlet end 40 of the tank 12. FIG. 5 is an enlarged partial cross-sectional view of the inlet end 40 of the pressure tank 12, while FIG. 6 is an enlarged exploded view of the components of the inlet end 40. The inlet end 40 of the tank 12 preferably includes a cylindrically-shaped, hollow inlet end cap 96 and a cylindrically-shaped, hollow inlet plug 98. The inlet plug 98 is inserted within and mates with and extends through the inlet end cap 96. The inlet end cap 96 includes a bottom flange 100 and a cylindrical top portion 102 with standard pipe threads formed on the cylindrical top portion 102 for attachment to a bottom portion 104 of the outer sidewall 54 of the pressure tank 12. The bottom portion 104 of the outer sidewall 54 having mating pipe threads formed on the inner surface thereof for mating with the inlet end cap 96. The inlet end cap 96 is preferably screwed into the bottom portion 104 of the outer sidewall 54. An o-ring 106 located on an

inner portion of the flange 100 seals the end cap 96 to the bottom portion 104 of the outer sidewall 54. The inlet plug 98 has a first end 108 for attachment to the first drop pipe 38 and a second end 110 for attachment to an inlet end 92 of the flexible bladder 58 within the tank 12. The first end 108 has threads for attachment of a fastener 112 to secure the inlet plug 98 in place within the inlet end cap 96. The second end 110 of the plug 98 includes a plurality of ribs 114 for connecting the inlet end 92 of the bladder 58 to the plug 98. At least one clamping device 116 fits over the ribs 114 of the second end 110 of the plug 98 to secure the inlet end 92 of the bladder 58 to the plug 98. The inlet opening 88 of the diaphragm bladder 58 is thereby clamped to the second, ribbed end 110 of the inlet plug 98 with the at least one clamping device 116. An o-ring 118 located around a center portion **122** of the plug 98 seals the connection between the plug 98 and the end cap 96. An opening 120 extending through the inlet plug 98 allows water to flow through the plug 98 to the center pipe 56 within the bladder 58.

FIGS. 7 and 8 illustrate the outlet end 42 of the tank 12. FIG. 7 is an enlarged partial cross-sectional view of the outlet end 42 of the tank 12, while FIG. 8 is an enlarged view of an outlet end cap 124 that connects the outlet end 42 of the tank 12 to the tank outlet drop pipe 44. The outlet end cap 124 includes a top flange 126 for enclosing the outlet end 42 of the tank 12, a center portion 128 for securing the outlet end cap 124 to the outer sidewall *54,* and a bottom portion 130 for connecting the outlet end cap 124 to an outlet end 94 of the bladder 58. The center portion 128 has threads embedded therein for mating with threads on the inner surface of a top portion 132 of the outer sidewall 54. The bottom portion 130 has ribs 134 for securing the outlet end 94 of the bladder 58 to the outlet end cap 124. At least one clamping device 136 fits over the ribs 134 of the bottom portion 130 to secure the outlet end 94 of the bladder 58 to the outlet end cap 124. The outlet opening 90 of the diaphragm bladder 58 is thereby clamped to the bottom, ribbed end 130 of the outlet end cap 124 with the at least one clamping device 136.

The top flange 126 has connections 138, 140 for connecting the outlet end 42 of the tank 12 to the tank outlet drop pipe 44 and the pressure switch 22. The bottom portion 130 of the outlet end cap 124 has a connection 142 for connecting to the center pipe 56 within the bladder *58.* A first opening 144 extending through the outlet end cap 124 between the center pipe connection 142 and the second drop pipe connection 138 allows water to flow from the center pipe *56* within the bladder 58 through the outlet end cap 124 to the tank outlet drop pipe 44. A second opening 146 extending through the flange 126 and the center portion 128 of the outlet end cap 124 allows pressurized air to flow from the pressure tank 12 to the

pressure switch 22. An o-ring 148 located on an inner portion of the top flange 126 seals the outlet end cap 124 to the sidewall 54 of the outlet end 42 of the tank 12.

Referring again to FIG. 4, the flexible diaphragm bladder 58 is connected between the inlet plug 98 and the outlet end cap 124. The components of the pressure tank 12 are preferably made out of a non-corrosive sanitary material, such as plastic or PVC to eliminate corrosion and bacterial growth. The flexible diaphragm bladder 58 is preferably made out of butyl rubber.

FIGS. 9A and 9B illustrate another embodiment of attaching and sealing the flexible diaphragm bladder 58 to the outer sidewall 54 and the inlet and outlet ends 40 and 42 of the pressure tank 12. The pressure tank 12 is preferably installed within the well casing 14 of a well. The flexible diaphragm bladder 58 preferably includes an inlet end 92 with an inlet opening 88 and an outlet end 94 with an outlet opening 90. The inlet end 92 of the bladder 58 is sealed between a flexible inlet fitting that forms the end cap 154 of the tank and is secured in place by a fastener assembly 158 that connects to the first drop pipe 38. An o-ring 150 seals the end cap 154 to the top of the sidewall 54. Likewise, the outlet end 94 of the bladder 58 is sealed between a flexible outlet fitting 152 that forms the end cap 156 of the tank and is secured in place by a fastener assembly 160 that connects to the second drop pipe 44. An o-ring 162 seals the end cap 156 to the top of the sidewall 54. This embodiment allows for easy repair and/or replacement of the bladder. The bladder is removed by removing the fastener assemblies 158, 160, removing the end caps 154 and 156, and lifting the bladder 58 out.

FIGS. 10A and 10B illustrate another embodiment of a water pressure system 170. A pressure tank 164 is installed within the well casing 166 of a well 168. The pressure tank 164 has no center pipe, with water stored on the outside of a flexible diaphragm bladder 172. The pressure tank 164 is connected to a control valve 174, a relief valve 176, and a submersible pump 178. FIG. 10A shows the bladder 172 of the tank 164 at maximum storage capacity, while FIG. 10B shows the bladder 172 of the tank 164 at minimum storage capacity.

The submersible pump 178 installed in the well 168 pumps water from a water bearing aquifer 180 through the relief valve 176, the flow control valve 174 to the pressure tank 164 installed in the well casing 166 of the well 168.

The output end 182 of the submersible pump 178 is connected to the relief valve 176. The relief valve 176 is preferably installed below the pumping water level 184 right above the submersible pump 178, so that the relief valve 176 is always under water, preventing mineral deposits from forming on the relief valve 176 that could adversely affect water quality. The relief valve 176 releases excess pressure in the system and limits back pressure

from building up in the submersible pump 178, especially on the motor bearings of the pump 178, which could fail if the relief valve 176 was not installed in the system. A first drop pipe 186 preferably connects the relief valve 176 to the flow control valve 174. The flow control valve 174 controls output flow from the pump 178 and relief valve 176. The flow control valve 174 maintains constant water pressure in the system and automatically adjusts the pump's output to match the flow requirements of the system. The flow control valve 174 also extends pump life by eliminating pump cycling, eliminating changes in water pressure and eliminating the need for a large storage pressure tank. A tank inlet drop pipe 188 connects the flow control valve 174 to the inlet end 190 of the pressure tank 164. A tank outlet drop pipe 192 preferably connects the outlet end 194 of the pressure tank 164 to a discharge pipe (not shown) for distributing pressurized water from the pressure tank.

The pressure tank 164 comprises an outer sidewall 196 with an inlet end 190 and an outlet end 194, the flexible diaphragm bladder 172, and a confining tube 198 for supporting the flexible diaphragm bladder 172 in the tank. The inlet end 190 and the outlet end 194 are sealed to the outer sidewall 196 at both ends of the pressure tank 164. The flexible diaphragm bladder 172 includes an inlet end 200 with an inlet opening 202 and an outlet end 204 with an outlet opening 206. An inlet end plug 208 seals the inlet end 200 and inlet opening 202 of the flexible diaphragm bladder 172. An outlet end plug 210 seals the outlet end 204 and outlet opening 206 of the flexible diaphragm bladder 172. The confining tube 198 prevents the bladder 172 from over expanding and allows a passage for water around the bladder 172 when it is fully expanded. An air chamber 212 exists on the inside of the flexible diaphragm bladder 172, and a water chamber 214 exists between the confining tube 198 and the outer sidewall 196. An air valve 216 extending through the tank outlet drop pipe 192 and the outlet end plug 210 allows adjustment of air pressure in the bladder 172. At least one bracket 218 attaches the bladder ends 200 and 204 and plugs 208 and 210 to the outer sidewall 196 of the tank 164 and hold the bladder 172 secure in the pressure tank 164. The brackets 218 are constructed to allow water to pass through and around them. At least one strap attaches the bladder 172 to the plugs 208 and 210 at each end of the bladder 172. The straps are preferably stainless steel. The bladder 172 is preferably made out of butyl or other FDA or NSF approved material. The outer sidewall 196 of the tank 164 can be made of plastic or other non-corrosive material such as stainless steel. An anchor system 220 attaches the bottom end of the bladder 172 and plug 208 to keep the bladder 172 from moving to the top of the pressure tank 164.

In FIG. 10A, the water pressure has the air on the inside of the bladder 172

compressed. In FIG. 10B, the bladder 172 is expanded to the confining tube 198. This tube 198 prevents the bladder 172 from over expanding and sealing off movement of water.

FIGS. 11A and 11B illustrate another embodiment of a water pressure system 222 having a pressure tank 164 installed within the well casing 166 of a well 168. The pressure tank 164 is connected to a control valve 224 with an integral relief valve 226 incorporated therein and a submersible pump 178. FIG. 11A shows the bladder 172 of the tank 164 at maximum storage capacity, while FIG. 11B shows the bladder 172 of the tank 164 at minimum storage capacity.

The output 182 of the submersible pump 178 is connected to the flow control valve 224 with the integral relief valve 226. The flow control valve 224 with integral relief valve 226 is preferably installed below the pumping water level 184 right above the submersible pump 178, so that the flow control valve 224 with integral relief valve 226 is always under water, preventing mineral deposits from forming on the relief valve 226 that could adversely affect water quality. The relief valve 226 releases excess pressure in the system and limits back pressure from building up in the submersible pump 178, especially on the motor bearings of the pump 178, which could fail if the relief valve 226 was not installed in the system 222. The flow control valve 224 controls output flow from the pump 178. The flow control valve 224 maintains constant water pressure in the system 222 and automatically adjusts the pump's output to match the flow requirements of the system 222. The flow control valve 224 also extends pump life by eliminating pump cycling, eliminating changes in water pressure and eliminating the need for a large storage pressure tank. A tank inlet drop pipe 188 connects the flow control valve 224 with integral relief valve 226 to the inlet end 190 of the pressure tank 164. A tank outlet drop pipe 192 preferably connects the outlet end 192 of the pressure tank 164 to a discharge pipe (not shown) for distributing pressurized water from the pressure tank 164.

The pressure tank 164 is the same as that shown in FIGS. 10A and 10B.

FIGS. 12A and 12B illustrate another embodiment of a water pressure system 228 having a pressure tank 164 installed within the well casing 166 of a well 168. The pressure tank 164 is connected to a variable speed submersible pump 230. FIG. 12A shows the bladder 172 of the tank 164 at maximum storage capacity, while FIG. 12B shows the bladder 172 of the tank 164 at minimum storage capacity.

In the water pressure system of FIGS. 12A and 12B, the submersible variable speed pump 230 installed in well 168 pumps water from a water bearing aquifer 180 to the pressure tank 164 installed in the well casing 166 of the well 168 for distribution and use. A tank inlet

drop pipe 188 preferably connects the output 182 of the submersible variable speed pump 230 to the inlet end 190 of the pressure tank 164. A tank outlet drop pipe 192 preferably connects the outlet end 194 of the pressure tank 164 to a discharge pipe (not shown) for distributing pressurized water from the pressure tank 164.

The pressure tank 164 is the same as that shown in FIGS. 10A and 10B.